

## PATENT ABSTRACTS OF JAPAN

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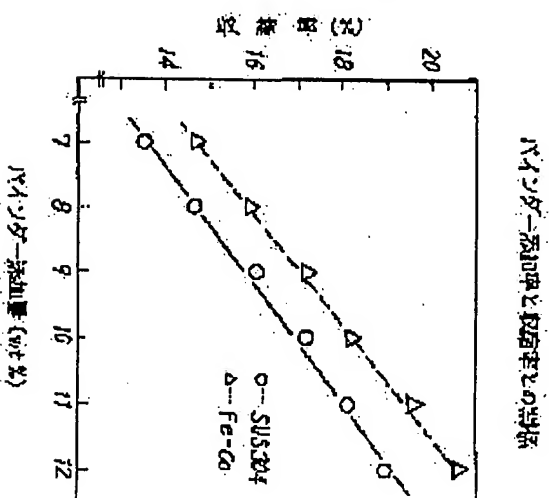
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## (54) COMPOSITE SINTERED BODY AND MANUFACTURE THEREOF

## (57)Abstract:

**PURPOSE:** To provide a composite sintered body consisting of different sorts of materials having no defect of generating warpages, cracks or interface peelings on the sintered body, because of its high affinity between the Interfaces and large degree of freedom in the interfaces, and also provide a manufacture of the composite sintered body by which the composite sintered body can be gained effectively.

**CONSTITUTION:** Such composite material consists of the part at least of two different sorts of materials, and the affinity between the interfaces in the part of different sorts of materials is high and, besides, the freedom of configuration is large. The composite sintered body is manufactured in a manner in which a binder consisting mainly of organic high polymer is added to respective material powders for powder metallurgy at least of two different sorts of materials, and they are kneaded for gaining a mixture, and then respective admixtures are molded for obtaining a composite molding and, subsequently, the composite molding is subjected to degreasing and sintering. Then, by previously finding a relation between the binder additive quantity and sintering contraction rate of respective admixtures, the binder additive quantity to material powder for metallurgical powder is controlled so that the difference of sintering contraction rate of respective admixtures becomes 0.5% or less.



MAY 22 2007

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May 15, 2007

Saile Ackerman LLC  
28 Davis Avenue  
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U. S. A.

Attention: Mr. Stephen B. Ackerman

Re: Advanced Materials Technologies, Pte. Ltd.  
Japanese Patent Appln. No. 2001-348551  
corres. to U.S. Serial No. 09/733,527  
Your Ref.: AMT00-002  
(Our Ref.: ME:ACH, A-1099-4/012183)

Dear Sirs:

1. We have received an official action from the Japanese Patent Office rejecting the subject patent application for the following reasons.

### Reason (1) for Rejection

This application does not satisfy the requirements for invention as stipulated in paragraph 6-2, Article 36 of the Patent Law, because the description of the claims and specification is improper with respect to the following:

(1) Regarding the expression "a second set of physical properties that are the same as said first set of physical properties with one exception" in claims 1 and 9, it is not clear how two kinds of mixture of powdered materials should be selected which have only one different physical property within a variety of physical properties. In the embodiment shown in

*See to Kelly 6/15/07  
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the specification, it is understood that the magnetic property is different between two mixtures of powdered materials. However, it is not possible to confirm that all of the remaining physical properties are the same.

Accordingly, what is defined by the present invention is not clear, and it is not recognized that the specification is clearly and sufficiently described so that a person skilled in the art can exploit the invention.

Note: In order to confirm that only one physical property is different, it is necessary to conduct a variety of or an indefinite number of evaluations on materials, and it is recognized that selecting such mixture of powdered materials is actually impossible. Unless the physical properties are specified, and measures by which similarities/differences of the physical properties being evaluated are specified, it is impossible to define the invention.

(2) Claim 1 specifies that shrinkage difference between two feedstocks is less than 1%. However, how and based on what facts this figure range is derived are not clear. The critical meaning of this figure range is not clear.

Note: As will be described in Reason (2), it is obvious that creation of cracks can be prevented more easily when shrinkage difference is made smaller. Thus, unless a critical meaning, e.g. technical advantages other than the prevention of creation of a crack, is found in the figure of 1%, the inventiveness is not admitted.

(3) Claims 2 and 10 state that the powdered materials have several kinds of properties as physical properties. However, it is apparent that some property values are obtained if evaluation of physical properties are conducted on the powdered materials.

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Therefore, fact that the powdered materials have physical properties itself is obvious.

(4) Claims 3 and 11 raise exceptional physical properties. However, as stated in item (1), it is not clear whether such property values can be specified. Also, there is no support in the embodiments in the specification regarding the physical properties raised in claim 3.

(5) The expression "% by weight" used in the claims is not based on the measurement law.

(6) Claim 6 states that the lubricants and binders are adjusted so that the shrinkage difference is less than 1%. However, in the specification, there is no description regarding the concentration and the kinds of the lubricants and the binders, the particle size of the stock powders, etc. It is recognized that undue trial and error are needed to control the shrinkage value as claimed in the claim even for a person skilled in the art. Accordingly, it is not recognized that the specification is clearly and sufficiently described so that a person skilled in the art can exploit the invention.

(7) The percentages by weight of the components claimed in claims 6 and 13 exceeds 100% and, therefore, it does not establish component composition.

#### Reason (2) for Rejection

The inventions claimed in the claims denoted below of this application are such as could readily be inferred from the inventions which were disclosed in the following publication or made available to the public through electric telecommunication lines in Japan or foreign countries prior to the filing date of this application and, therefore, under the provisions of paragraph 2, Article 29 of the Patent Law, they cannot be patented.

References

- (1) Japanese Patent Application Public Disclosure  
No. 5-208405 (1993)
- (2) Japanese Patent Application Public Disclosure  
No. 5-195022 (1993)

Examiner's Comments

Against Claims 1-14, references (1) and (2) are cited.

References (1) and (2) disclose a technique for making small shrinkage difference between powdered materials upon compounding and sintering two kinds of powdered materials having different magnetic properties. Reference (1) also discloses making the shrinkage difference lower than 0.5%. A person skilled in the art would normally consider to prevent the generation of cracks along interface due to the shrinkage difference upon sintering a compound body.

Accordingly, it is recognized that the invention of claims 1-14 could readily be inferred based on the technique shown in references (1) and (2) by a person skilled in the art.

Due date for reply: June 29, 2007

(NOTE: This term can, upon application,  
be extended by three months.)

We obtained a three-month extension of term at our own expense making the deadline for response September 29, 2007.

- 2. For your reference, we are enclosing a copy each of the cited references and an English abridgement of reference (1). Reference (2) is cited in the previous official action as reference (1) and, therefore, we are not enclosing a translation thereof.

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In reference (1), example of the first powdered material is Fe: 50 wt% - Co: 50 wt% and the second powdered material is SUS 304. Reference (1) does not refer to the difference in magnetic properties of the powdered materials itself.

In reference (1), Fig. 1 is a graph showing the relationship between additive amount of a binder and shrinkage, Fig. 2 an intermediate product of the invention, Fig. 3 a compound sintered body of a first embodiment, Fig. 4 a extrusion molding machine of a second embodiment, Fig. 5 a sectional view of a compound sintered body of a second embodiment.

3. Our Comments:

From the examiner's comments, in particular points (1) and (2) in reason (1), it appears that it is not easy to overcome reason (1). However, we should rebut all points in reason (1) as much as possible.

With respect to point (1) in reason (1), we will have to specify the physical properties of each powdered materials and exceptional physical property in claim 1. Also, we will have to clarify that all of the physical properties other than the magnetic property are the same in the embodiment of the specification.

Regarding point (2), please explain the critical meaning of "shrinkage difference lower than 1%". Since it is impossible to include such critical meaning in the specification, we will explain it in the argument.

Regarding points (3) and (4), we will have to rebut these points. Please provide us with your rebuttal comments.

Point (5) can be handled at our end.

Regarding point (6), we will have to rebut this point. It appears that the kind of the lubricants and binders and the particle size of powdered materials are described in the specification. We are not sure whether the disclosure

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is not sufficient for a person skilled in the art to exploit the invention. We would appreciate having your comments regarding this point.

Point (7) was caused by deletion of the term "about" from the claims. This will be dissolved by changing the expression regarding "iron" or other component from wt% to balance.

With respect to Reason (2), we consider that there are still some differences in construction between the subject invention and the cited references. However, the difference in technical advantages derived from such different construction is not always clear. We consider that that would be the reason why the Examiner did not admit substantive differences between the subject invention and the cited references. Japanese examiners tend to put weight on differences in technical advantages for evaluating inventive step of the invention over the cited references.

Accordingly, please provide us with your comments distinguishing the present invention over the prior art references cited by the examiner. In particular, please indicate to us any limitations recited in the main claim or independent claims that are missing from the prior art references together with technical advantages derived therefrom. If any further features should be recited in the main claim or independent claims to help distinguish over the references, please provide us with such additional features and technical advantages derived therefrom.

If you have any questions concerning the office action, or if you need our assistance in replying to the office action, please let us know. Otherwise, we look forward to receiving your instructions to prepare and file a response to the outstanding office action at your earliest convenience.

Yours very truly,



A. Chiba

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Encls.